

Alternate Humectant

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Richmond, Virginia

To: . Dr. Robert McCuen Date: July 25, 1988

From: . Elizabeth D. Mooz

Subject: . Third Quarter Organizational Plans for the Alternate Humectant Program (AHP) for 1988: I. Production of a PG/G-free Cigarette and II. Production of a G-free, domestic Marlboro-type cigarette for a POL test

PART I:

Objective

To produce an acceptable cigarette (domestic Marlboro-type) which is PG/G-free by the end of 1988. In order to do this, the following goals have been (or are being) accomplished.

PG/G-free feedstocks (RL, RCB, ET and ESB) were prepared.

PG/G-free casings and flavors (Burley spray, Burley top casing, Bright casing and after cut) were prepared and are being evaluated.

Background and Status

Since the second quarter Organizational Plans for the AHP for 1988 were written, (1) the following work has been done.

1. Six PG/G-free RL sheets containing 6% added isosweet and 700 ppm potassium propylparaben (K-pp) were prepared at Park 500 in March, 1988 (2). The K-pp was added to the size prep after running the plant without PG-pp for 12 hours. 65 gal of K-pp were synthesized at R & D (3) and transported to the production plant. 5 HHDS each of two control sheets were also made: one using a normal blend (with class + scrap, 3% PG, 2.5% G, and 700 PG-pp) and a special control (with all scrap and no class, plus the other components used in the control).

Subjective evaluations of 100% cigarettes made from the six PG/G-free RL sheets were made by the Flavor Development smoking panel. The three 100% RLTC cigarettes (RLTC control, RLTC special

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control, and RLHFNC test) gave a similar response (4) and the three 100% RL150B cigarettes (RL150B control, RL150B special control, and RLBHFNC test) gave a similar response (4). Analytical results for all the PG/G-free RL sheets showed that there was 0.2% (or below) PG, and 0.2% (or below) G. Microbiological tests run on the RL sheets with 6% isosweet and K-pp, in place of PG/G and PG-pp, did not promote any deleterious microbiological effects versus control sheets (5). Zero-time pad and material balance survivability studies have been run in the Semi-works on the test and control RL sheets. The results are being evaluated. Toxicology studies were done on the test and control cigarettes and no significant differences were found between the two (6).

2. Three PG/G-free RCB sheets were made at the BL Plant in mid-April containing scrap (no class) and an additional 4% isosweet. 700 ppm K-pp was added to the slurry in the mixing tank in place of PG-pp prior to the 3 hr cook. 5 HHDS each of a normal control RCB using class tobaccos, 3% PG, 4% G and 700 ppm PG-pp and a special control using scrap (no class) with the other components similar to the control were also made (7,8).

Subjective evaluations of 100% cigarettes made from the three PG/G-free RCB sheets (RCB control, RCB special control, and BLNC00 test) were made by the Flavor Development smoking panel. The BLC34 control and the PG/G-free, BLNC00 test cigarettes gave a similar response, while the BLNC34 special control cigarette was considered to be atypical of RCB (4). Analytical results for the PG/G-free RCB sheets showed that there was 0.2% (or below) PG, and 0.2% (or below) G. Microbiological tests run on the RCB sheets with 4% isosweet and K-pp, in place of PG/G and PG-pp, for eight of the twelve week storage study, did not promote any deleterious microbiological effects versus control sheets (9). Zero-time pad and material balance survivability studies to be run in the Semi-works on the test and control RCB sheets have been requested. Toxicology studies were done on the test and control cigarettes and anomalous results were obtained. The cigarettes were retested and accounting for dilution effects, there was no difference between the test and the control (6).

3. G-free DIET was prepared at the MC and G-free ESB was made in Louisville (DIET and ESB do not contain any PG).

Analytical tests showed that there was 0% PG and 0.2% G for both test feedstocks. The control DIET contained 0% PG and 1.5 - 1.8% G, while the control ESB contained 0% PG and 1.3% G.

4. An initial set of PG/G-free casings and flavors have been prepared by Flavor Development Personnel (10).

Strategies

Using PG/G-free feedstocks and casings/flavors a PG/G-free, domestic Marlboro and a control Marlboro will be made in the Semi-works.

Subjectively evaluate both cigarettes to obtain parity between the test and control.

Additional PG/G-free flavors and casings will be made and another PG/G-free, domestic Marlboro and a control Marlboro will be remade in the Semi-works, if necessary.

Tactics and Timetable

The following revised schedule of testing is projected:

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|-------------|---|
| 8/1 - 8/12 | Zero-time pad and material balance survivability of the production plant RCB sheets in the Semi-works |
| 9/1 - 9/15 | Survivability of test and control DIET and ESB feedstocks |
| 7/25 - 9/30 | Using the PG/G-free feedstocks and flavors/casings make a small-scale, blended domestic Marlboro in the Semi-works. A suitable control cigarette will also be prepared (11). Physical and chemical analyses of blended, test and control cigarettes will be done to confirm target levels (11). Subjective analyses of test and control cigarettes by Flavor Development personnel will be made (11). |

In the event that the first model is not satisfactory, new flavors/casings will be made and another PG/G-free blended, domestic Marlboro and a suitable control cigarette will be made in the Semi-works. It is estimated that the time necessary to remake and retest another PG/G-free blended cigarette model will take from four to six weeks (12).

After a suitable PG/G-free cigarette model is obtained, maker survivability of test and control blends will be done at an appropriate time.

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| 10/3 - 10/28 | Assess data and make recommendations |
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PART II:

Objective

To produce an acceptable G-free, domestic Marlboro-type, cigarette for a POL test. In order to do this, the following goals must be accomplished.

Use existing G-free feedstocks (RL, RCB, ET and ESB)

Use G-free casings and flavors (Burley spray, Burley top casing, Bright casing and after cut) prepared by Flavor Development personnel

Background and Status

Since the second quarter Organizational Plans for the AHP for 1988 were written, it was decided by management to send out a domestic POL to test the acceptability of a G-free, domestic Marlboro versus a control Marlboro. To meet this objective, the following items were done:

G-free RLTC, RL150B, and RCB Production Plant sheets were used with G-free DIET and ESB and G-free casings and flavors to make a domestic, Marlboro-type cigarette in the Semi-works. A suitable Marlboro control was also prepared. Analytical tests showed that the FTC Tar was 16.2 mg/cigt. for the test cigarette and an average value of 16.7 mg/cigt. for the control cigarette. The level of PG was about 3% for the G-free cigarette, while the value of G was 0.3%. In the control cigarette the level of PG was 1.0% and the value of G was 1.2%.

At least three different subjective analyses of the control and G-free POL cigarettes were run. As a result of the subjective findings of the Richmond Smoking Panel and the analytical information cited above, it was decided to cancel the POL test scheduled to be sent out in April (13).

Strategies

Using G-free feedstocks and casings/flavors a G-free, domestic Marlboro and a control Marlboro will be remade in the Semi-works as POL 3582.

Analytically and subjectively evaluate both cigarettes to obtain parity between the test and control.

If approved by Flavor Development personnel, the cigarettes will be sent out as POL 3582.

Tactics and Timetable

The following schedule is projected for the POL test:

7/18 - 7/22	Remake G-free POL cigarette and control with altered flavors/casings.
7/25 - 7/29	Analytical analysis and subjective analysis of remade, G-free POL cigarette and control.
8/15 - 8/19	Examine data and, if acceptable, mail out POL
9/26 - 9/30	Close out POL
10/1 - 10/31	PED personnel will analyze results and a report will be written.

Resource allocation

The following resources are necessary to complete the above work. The numbers are the estimated person-years necessary to complete the 1988 objective, based on 1785 hours/person-year.

<u>Division</u>	<u>Prof.</u>	<u>Tech.</u>	<u>Total</u>
Flavor Development	0.5		0.5
Product Evaluation	0.1		0.1
Tobacco Materials	0.5		0.5
Tobacco Processing	0.1	0.4	0.5
Biochemical Research	1.0	1.0	2.0
Analytical Research	0.9		0.9
Cigarette Testing	0.4	0.6	1.0
Computer Applications	0.6	0.1	0.7
Administrative Services	0.3	0.3	0.6
Technical Information	0.2	0.1	0.3
			7.1

It is estimated from previous experiences with this Program, that the areas that are involved with many other high priority programs are the Analytical Research Division, the Flavor Development Division (Project 2305) and the Semi-works. Of these three, getting test cigarettes through the Flavor Development area presents the greatest challenge.

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Impact on other areas

Within R & D - Using the timetable and resource section it is obvious that the Flavor Development Division personnel are the key to the success of the Program throughout 1988.

Special Note - G-free Production Plant sheets (both RL and RCB) and control sheets will be exhausted after this G-free POL remake. If additional POL models or additional tests need to be run, it will be necessary to go back to Park 500 and the BL Plant and make additional G-free feedstocks.

General information regarding the program

At the Second Quarter Planning Meeting, Dr. Robert McCuen showed samples of the PG/G-free RL and RCB sheets that were made at the Production Plants. It was noticed that the PG/G-free RCB contained "blotches" or uneven coloration on the surface of the sheet. Gus Keritsis said that this phenomenon was most likely from a "non-uniform drying problem". Chuck Haywood stated that the "non-uniform mix in the BL test slurry probably arose because of the presence of isosweet and the lack of a PG/G humectant. One role that the PG/G humectants play in the mix is to keep all the solid components suspended". Bernie Laroy spoke about the "Technology Assessment Program" and stated that Cliff Lilly and John Shug (VPI & SU) are using the computer to develop "theoretical 'best-fit' models, using exact fit, Monte Carlo studies, with glycerin and water as humectants". The purpose of this project is to develop a basic understanding of "how humectants work". Information that they obtain as a result of this study may be of potential use in this project at some future time.

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